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ABSTRACT

To prepare diverse learners for various roles in life, teachers should develop contextualized learning environments that enable students to develop individual skills while contributing to the knowledge of the classroom community. This is accomplished by integrating various subject matter domains with interdisciplinary themes that incorporate real-life roles and contexts. This paper provides a framework for designing and implementing integrated units that address the needs of all students. The challenge is to promote learning and inclusiveness by engaging and scaffolding students with varying abilities. This is accomplished through thematic, integrated lessons that utilize various media and technologies. Experts in the fields of learning, cognition, and instructional-design suggest approaches that serve as guidelines for tailoring instruction to meet the needs of all students so that they may participate to the fullest extent possible and progress to increasingly higher levels of expertise. Drawing upon theory, such instruction may be designed by utilizing the following steps, each of which is discussed in this paper: determine broad goals; establish an enriched context; develop domain-specific goals related to the context; use multiple, authentic assessments as a base line for developing individual learning experiences; use a variety of strategies and activities that address diverse learning styles; provide a variety of media and technology to individualize learning; scaffold through constant monitoring and guidance; allow time for student work to be self-paced; encourage a learning community that values the input of individuals; and extend learning and transfer in subsequent themes. (Contains 25 references.) (Author/AEF)

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ED 470 145

Individualized Instruction: An Integrated Approach

Kathleen J. Tate
Margie L. DeBroux
Florida State University

Abstract

To prepare diverse learners for various roles in life, teachers should develop contextualized learning environments that enable students to develop individual skills while contributing to the knowledge of the classroom community. This is accomplished by integrating various subject matter domains with interdisciplinary themes that incorporate real-life roles and contexts. This paper provides a framework for designing and implementing integrated units that address the needs of all students.

Introduction

As K-12 classrooms continue to diversify, it becomes increasingly important that teachers structure learning experiences to meet the individual needs of all students. Many students cope with learning and emotional disabilities, economic challenges, and limited English proficiency. Instruction must be designed to engage such students while appealing to multiple learning styles and those who are gifted. Instruction is more meaningful for students as they progress through material that is presented in an integrated, individualized manner. The challenge is to promote learning and inclusiveness by engaging and scaffolding students with varying abilities. This is accomplished through thematic, integrated lessons that utilize various media and technologies. Literature on learning theories informs the development of such student-centered environments. Experts in the fields of learning, cognition, and instructional-design suggest approaches that serve as guidelines for tailoring instruction to meet the needs of all students so that they may participate to the fullest extent possible and progress to increasingly higher levels of expertise. Drawing upon theory, such instruction may be designed by utilizing the steps listed below and displayed graphically in Figure 1.

Determine broad goals
Establish an enriched context
Develop domain-specific goals related to the context
Use multiple, authentic assessments as a base line for developing individual learning experiences
Use a variety of strategies and activities that address diverse learning styles
Provide a variety of media and technology to individualize learning
Scaffold through constant monitoring and guidance
Allow time for student work to be self-paced
Encourage a learning community that values the input of individuals
Extend learning and transfer in subsequent themes

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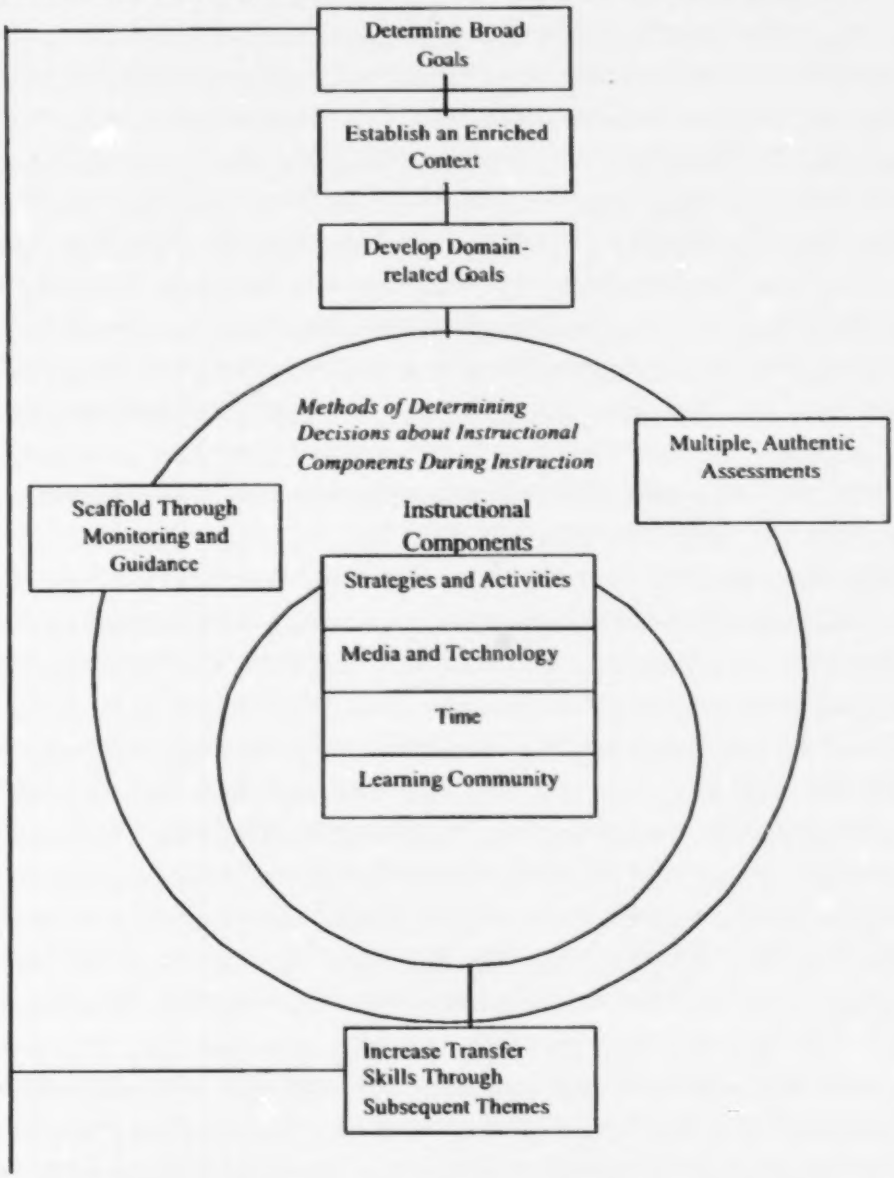
Figure 1. Model for Designing and Implementing Integrative Thematic Unit for Individualization



Determine Broad Goals

The first step in designing an individualized, integrated learning environment is to identify the broad picture and goals of society (Harless, 1998). If the ultimate outcome of education is to produce accomplished citizens, then instructional goals must move beyond a subject matter orientation. Rather than developing lessons to teach in response to segregated math, science, and language arts goals, planning should first address broader goals that equip students with the skills, knowledge, and attitudes that will prepare them for various roles in society (Harless, 1998, p.48). Once those broader goals are developed, the teacher may translate them into smaller competencies (Gagne, Briggs, & Wager, 1992 pp. 145-184). Reigeluth's (1999) Elaboration Theory advocates beginning with broader topics within a domain and then progressing to more detailed principles, which provides a sequence that "enables learners to understand the tasks holistically" (p.433). Reigeluth further explains that this type of instruction allows students to develop a schema, which can be expanded through subsequent lessons. Addressing subject matter goals through a rich, integrated, contextualized environment facilitates making meaning and connections of new knowledge.

Establish a Context

Providing an enriched environment that includes adequate resources and is based upon relevant topics that emphasize real people and places engages and sustains interest (Kovalik 1997; 1999). For example, a fifth grade classroom begins a two-week unit with an around-the-world theme. When the students enter the room on the first Monday of the unit, they find maps, newspapers, pictures, and other artifacts representing various regions from around the world lining the walls and tables of the classroom. Students instantly become immersed in a contextualized environment, which will engage them in activities that promote deeper understanding of people and cultures of the world. These learning experiences will prepare students to become global citizens.

The teacher begins by reading *Letters From Felix* (Langen & Droop, 1994) aloud to the students. This story is about a stuffed rabbit named Felix who gets separated from his owner, Sophie at an airport. Felix boards numerous planes and travels around the world to several countries as he tries to find his way back home to her in Ohio. As Felix stops in each country, he writes a letter to Sophie and includes descriptions, drawings, and pictures of what he sees. As Sophie receives each letter, her family discusses characteristics of the described country. The book has envelopes with pullout copies of these letters. This story sets the context for learning activities and motivates children to learn more about other cultures and regions.

Develop Domain-Specific Goals

As students take on the role of global citizen during the unit, they develop a greater understanding of their world and develop skills in specific subject areas in meaningful ways. Math, science, social studies, art, language arts, and technology objectives easily emerge and skills are applied in realistic ways. Math goals are addressed as students learn to measure and calculate distances traveled; compare and contrast data; use calculators to compute travel budgets; and add, subtract, multiply, and divide numbers with decimals. Science goals are addressed as students discover global weather patterns and landforms. Learners apply the scientific process as they conduct local weather experiments and compare data with other cities. Social studies goals are attended to as students develop an understanding of diverse cultures, places, and environments. Art goals further such understanding as students study art and artifacts of cultures. For example, students may discover that artists Vincent Van Gogh of the Netherlands, Diego Rivera of Mexico, and Faith Ringgold of the United States all spent time in Europe and created paintings of sunflowers. These kinds of patterns promote dialogue about similarities and differences among countries.

As students use the Internet, software, and word processing to gather and express information, they become proficient in the use of technology, which is in alignment with national technology goals. Language arts goals thread these content area goals as students read, research, speak, and write about global information. Students read a broad range of fictional and non-fictional texts to promote understanding. Regional poetry, music, and folk literature enrich data gathered from encyclopedias, newspapers, and maps. Refer to Figure 2 for an abundant list of goals addressed in this particular unit.

Figure 2. National Standards Addressed in this Scenario

National Standards Addressed in this Scenario

SCIENCE

National Science Education Standards

http://www.nap.edu/readingroom/books/nses/

Students develop understanding of populations, resources, and environments.

Students develop understandings about scientific inquiry.

Students develop abilities necessary to do scientific inquiry.

SOCIAL STUDIES

National Council for the Social Studies

http://www.socialstudies.org

Students develop understandings of cultural diversity.

Students develop understandings of people, places, and environments.

Students develop understandings of global connections and interdependence.

MATH

National Council of Teachers of Mathematics

http://www.nctm.org

Students understand various meanings of multiplication and division.

Students understand the effects of multiplying and dividing whole numbers.

Students develop fluency in adding, subtracting, multiplying, and dividing whole numbers.

Students understand the need for measuring with standard units and become familiar with standard units in the customary and metric systems.

Select and apply appropriate standard units and tools to measure length, temperature, etc.

Students collect data using observations and experiments.

Students solve problems that arise in mathematics and other contexts.

Students organize and consolidate their mathematical thinking through communication.

LANGUAGE ARTS

National Council of Teachers of English

http://ncte.org

Students read a wide range of print and nonprint texts to build an understanding of texts, themselves, and of the cultures of the United States and the world and to acquire new information. Among these texts are fiction and nonfiction.

Students read a wide range of literature in many genres to build an understanding of many dimensions of human experiences.

Students adjust their use of spoken, written, and visual language to communicate effectively with a variety of audiences and for different purposes.

Students conduct research by gathering, evaluating, and synthesizing data from a variety of sources to communicate their discoveries in ways that suit their purpose and audience.

Students use a variety of technological and information resources to gather and synthesize information and to create and communicate knowledge.

Students use spoken, written, and visual language to accomplish their own purposes (e.g., for learning, persuasion, and the exchange of information).

ARTS

National Standards for Arts Education

http://www.didaxinc.com/standards/artstandards.html

Students relate various types of arts knowledge and skills within and across the arts disciplines. This includes mixing and matching competencies and understandings in art-making, history and culture, and analysis in any arts-related project.

Students develop and present basic analyses of works of art from structural, historical, and cultural perspectives, and from combinations of those perspectives. This includes the ability to understand and evaluate work in the various arts disciplines.

Students communicate at a basic level in the four arts disciplines—dance, music, theatre, and the visual arts. This includes knowledge and skills in the use of the basic vocabularies, materials, tools, techniques, and intellectual methods of each arts discipline.

TECHNOLOGY

International Society for Technology in Education

http://cnets.iste.org

A. Students are proficient in the use of technology.

Students use technology tools to enhance learning, increase productivity, and promote creativity.

Students use productivity tools to collaborate in constructing technology-enhanced models, prepare publications, and produce other creative works.

Students use technology to locate, evaluate, and collect information from a variety of sources.

Students use technology tools to process data and report results.

Use Multiple Authentic Assessments

Individualizing instruction is necessary so that *all* students can participate in this unit. If, for example, the reading levels of this fifth grade class range from first to seventh grade, one textbook would not be at an appropriately challenging level for all. Teachers must choose appropriate media and technology to scaffold learners with varied abilities. According to Vygotsky (1978, p.86), each student has a zone of proximal development, which is "the distance between actual development level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers." In order to determine the student's beginning point of his/her zone of proximal development, teachers should use multiple forms of authentic assessments. The unit's contextualized activities serve as tasks for assessment. Frederikson & Collins (1989, p.31) advocate that tasks "included within an assessment system would vary from structured tasks that measure students' understanding of critical concepts or skills to open-ended tasks that allow students to demonstrate special knowledge and creativity". The many open-ended products throughout this thematic unit provide information about the reading levels, learning styles, strengths, and weaknesses of students that further inform media, technology, and strategy selection during the unit and in subsequent units.

Use a Variety of Strategies and Activities that Address Diverse Learning Styles

Humans in all cultures use multiple intelligences to solve problems and to create products (Gardner 1983). Gardner's (1999) intelligences include verbal-linguistic, math-logic, spatial, bodily-kinesthetic, musical, interpersonal, intrapersonal, and naturalist. Students may be more developed in certain areas, but should have the opportunity to strengthen all intelligences. The eight intelligences should be considered when developing lessons. A variety of teaching and learning strategies can be used to facilitate the development of the intelligences throughout any unit. Refer to Figure 3, which details the ways the multiple intelligences are addressed in this context.

Figure 3. Activities Within Each of the Multiple Intelligences

	Math	Science	Social Studies	Art	Language Arts
Verbal-Linguistic	Discuss budget	Read, write, and report on findings	Read, write, and share orally	Read and write about art/artists; discuss	Read, write, discuss
Math-logic	Compare/ contrast distances, compute travel budgets	Identify global weather patterns; compute average temperatures, rainfall, etc.	Further understanding through dates, distances, etc.	Understand art periods through timelines, etc.	Classify data for reports and projects
Spatial	Use maps to gather data	Read weather maps and charts	Use maps, timelines, and other visuals	Critique and create art	Use visuals (in addition to text) to gather information
Bodily-Kinesthetic	Use manipulatives to explore concepts	Use weather instruments to gather data; conduct experiments	Role-play: make a travel commercial and videotape; create interactive projects (envelope reports, rabbits, etc.)	Create art pieces	Learn through hands-on activities
Musical			Listen to national anthems and regional music	Listen to music that coincides with the time period of an art piece	Further understanding of cultures through poetry and music
Interpersonal	Work collaboratively to solve problems	Work cooperatively with others to locate and analyze data	Work with others	Relate to others through art	Cooperate with others
Intrapersonal	Work independently to solve problems; work at own pace	Work independently; work at own pace	Work independently; work at own pace	Express oneself through art	Work independently and at own pace
Naturalist		Explore weather patterns and collect data outdoors		Use live objects and the outdoors when creating art	

Provide a Variety of Media and Technology

Media and technology are powerful tools in aiding a teacher in individualizing instruction. Media may be selected so that each student is working within her zone of proximal development. Multimedia programs increase acquisition and retention of information by enlisting a variety of senses as students gather data visually and aurally. Technology has a dichotomous role in individualizing instruction because it gives students control over their learning and adapts to their responses accordingly.

After *Letters From Felix* (Langen & Droop, 1994) is read and discussed, students label maps and chart Felix's path of travel. Then, students form heterogeneous groups to further research one of the countries he visited. Knowing the reading levels is critical for this activity. Books about countries that are written with larger print, provide more pictures, and use simpler sentence structures scaffold lower-level readers. The series that includes *Postcards From Russia* (Arnold, 1996) and *Postcards From Mexico* (Arnold, 1996) serve this purpose. Books that have more sophisticated vocabulary and sentence structure, such as *The Portable World Factbook* (Lye, 1995), are

more appropriate for higher-level readers. These books, in conjunction with software, scaffold group members as they refine their research skills and seek details about their assigned country. The groups use IBM's *World Book Millennium 2000* CD-ROM to quickly locate pictures, music clips, timelines, and maps. This software is motivating, appeals to diverse learning styles, and enables students to quickly access detailed information about related topics by linking to other articles on the disk's encyclopedia. The plethora of visual information allows children with limited English proficiency or learning disabilities to gather data without having to rely on text.

Scaffold Through Monitoring and Guidance

The teacher serves as a guide through this research process and as Jonassen (1999, p.230-6) describes, may provide modeling and coaching to further scaffold learners. The teacher may demonstrate note taking, highlighting, concept mapping, and software usage. As students work, the teacher monitors and informally assesses progress. Students apply their new knowledge about their country by writing a detailed letter to Sophie from the perspective of Felix. Writing on transparencies facilitates sharing, as the letters can be projected onto a larger screen. Groups may use a combination of text and drawings, as Felix did, to convey interesting details about their assigned country.

Groups may work at their own pace to complete letters and share accordingly. If others finish earlier, they may go on to individually research a country that was not mentioned in the story. Software, leveled books, maps, and other resources scaffold students as they apply their research skills in a new assignment. Text and drawings depicting the country's characteristics are added to index cards that are placed into envelopes. Separating and labeling data on cards by categories such as climate, economy, government, history, flag, location, and population promotes classification skills. Finished envelopes are displayed on an interactive bulletin board, so that classmates may explore envelopes and read about other countries. For students with writing, spelling, and drawing challenges, additional software such as *Storybook Weaver Deluxe, Start Write, Creative Writer, and Word* may be used so that *all* students can participate. Printed documents can be inserted into the envelopes instead of index cards.

Some students may finish before others. As they do, they are given paper cutouts of rabbits. Students synthesize information from their envelope research projects and use text and drawings to depict their country's characteristics on one side of the rabbit. They use resources to locate and express the same kind of information about their home state on the opposite side of the rabbit. The rabbits are hung with string from the ceiling and provide continuity for the context of Felix, the world traveler.

Allow Time for Student Work to be Self-Paced

Imagine this fifth grade classroom: as students complete their envelopes, others are comparing and contrasting state and country facts on paper rabbits, while others are moving on to the next task at their own pace. Carroll (1963) posits that students learn at varying rates and should be given adequate time to learn new material. He suggests that as students master objectives before others, they go on to participate in enrichment activities. Ample time to "thoroughly explore, understand, and use information and skills" (Kovalik 1997; 1999) leads to comprehensive understanding. Opportunities to repeat skills within the same theme and in subsequent themes extends schema and reinforces learning (Reigeluth 1999; Kovalik 1997; 1999).

Encourage a Learning Community

Next, learners are grouped into pairs. The teacher discusses persuasion and how it is used. The pairs choose a country to research and use the facts to persuade people to visit this country via a travel commercial. Students write a persuasive script, include five to ten details about the country, construct a backdrop and props, and present a travel commercial in front of the class as the teacher video tapes it for later review. This experience provides yet another form of assessment for the teacher and allows students to capitalize on and increase their intelligences as Gardner (1983, 1999) suggests. In this case, the travel commercial engages students in role-playing and collaboration to increase understanding.

All students may not complete a travel commercial. When most students complete most tasks, the class explores and discusses the format of local, national, and international newspapers. The unit's culminating project is the creation of a global newspaper. This project promotes community and collaboration through problem solving, planning, and coordination. Since knowledge is distributed among the students in the classroom community (Hewitt & Scardamalia 1998), knowledge is shared (Scardamalia & Bereiter, 1994) as students rely on each other to build knowledge and complete the task (Bell & Winn, 2000, p.128-9). This project promotes individualized instruction within a community setting. Students, who are most interested in sports, may report on current sporting events from

around the world. Students motivated by scientific topics may report on global weather conditions or current innovations in medicine and technology. Students intrigued by numbers and patterns (Gardner 1999) may report on business trends or compute average temperatures around the world. Others may use narratives (Gardner 1999) to express insights into diverse cultures. Creating a class newspaper is a large undertaking and requires all students to contribute to ensure its completion. This implies that participants have a shared interest (Wenger, 1998) and are motivated to work together to make a collective product (Scardmalia & Bereiter, 1994). Software, such as *Creative Writer*, provides a template to create a newspaper where students make choices about the number of columns and the type of font, headlines, borders, and graphics to be used. The Internet serves as another scaffolding tool to help learners acquire current information for their newspaper articles. The final product serves as another assessment piece and can be shared with younger grades or community members.

Extend Learning and Transfer in Subsequent Themes

One measure of learning is the ability to transfer new knowledge to other contexts. Though not proponents of situated learning environments, Anderson, Reder, and Simon (1996) studied the work of others to determine three components related to transfer. Their findings indicate: (1) there are varying degrees of transfer, including negative transfer; (2) representation and degree of practice are major determinants of transfer between tasks, and transfer between different domains varies directly with the number of symbolic components shared between them; and (3) the amount of transfer depends on where attention is drawn during instruction (p. 6-8).

To increase the degree of transfer, subsequent themes may be developed that review and expand on the skills learned in the first unit. Using similar characters and tasks in later units facilitates the transfer of knowledge and provides students a framework to build knowledge upon in new contexts. For example, Felix's travels may lead to further inquiry as he visits the moon in *Felix Explores Planet Earth* (Langen & Droop, 1996) or as he travels back through history in *Felix Travels Back in Time* (Langen & Droop, 1995). Felix may even be introduced to another traveler such as Flat Stanley, who slips through the mail. Flat Stanley is a young boy who fits into envelopes because he was flattened by a bulletin board temporarily in *Flat Stanley* (Brown, 1964; 1992). Units developed around these stories and characters serve to extend prior knowledge in new ways so that students may progress toward increasingly difficult objectives. This kind of connected, threaded curriculum helps learners' brains seek patterns and develop a mental organizer to extract from over and over again (Kovalik 1997; 1999).

Applying Theory: Why This Works

This sample unit exemplifies components of learning models espoused by experts. This unit promotes knowledge construction through hands-on activities, collaboration, problem solving, and active engagement (Abdal-Haqq, 1998). The varied activities address diverse learning styles by appealing to visual, oral, auditory, and tactual senses and employ multiple intelligences (Gardner 1999) by engaging students in collaboration, mathematical computation, hands-on activities, and role-playing. Retention of material is greatly increased as Sousa (2001, p.95) explains the average retention rate 24 hours after lecture is 5%; after reading is 10%; after audiovisual exposure is 20%; is 30% after demonstration; is 50% after discussion; is 75% after practice by doing; and after immediate use of learning is 90%.

Understanding is further increased through the pursuit of broad goals in thematic, integrated contexts where media and technology scaffold learners as they complete individual and group projects. Since students collaborate and share knowledge at different points in the unit, they develop cooperation skills that can be applied later in real life situations. Students simultaneously learn that everyone has an area of expertise and something to contribute. The continual application of skills in different contexts during the unit leads to mastery of both knowledge and skills in a threaded manner that can be revisited in subsequent lessons. Through this holistic approach to instruction, teachers facilitate the development of multifaceted citizens who are better prepared for a global society and its diversity, which is the ultimate goal of education.

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